COMPUTER GRAPHICS

Computer graphics – even when the term is loosely defined – appears as yet to have found little application within the various activities of DDI. Work has been done and is proceeding in three general areas which could be laying the basis for more extensive use of computer graphics. The three areas are automated map making, assistance to photo interpretation, and assistance in visual cognition of large data bases.

We bring these together in this memorandum under the term "computer graphics" to indicate that there is a commonality of interests and potential synergism among these areas.

I. PRESENT SYSTEMS

A. AUTOMATED MAP MAKING - AUTOMAP

The Office of Basic and Geographic Intelligence has developed the software and digitized map data bank (small now, but growing) which allows producing on an automatic plotter any one of many maps in some seventeen projections with relative ease and great flexibility. The system is operational, and described in Appendix 6 of the ASPIN reports.

The library of digitized maps will grow and new data will be added to existing maps, such as additional features, or changes in boundaries, etc. It would be useful in such cases to visually check the updating changes without the expense and time to reproduce the map on the plotter.

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Obviously, a combination of technology, costs, and system needs will determine eventually which of these features is adopted. For these reasons, all reasonable alternatives should be examined in the light of the forthcoming system tests before a final design is chosen for operational use.

5. Costs

Given the state of development, and the substantial uncertainties regarding the features to be included in the final system, and the hardware required, it is almost impossible to make any reliable estimates of costs.

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Should the project continue, costs are bound to be considerably higher from now on. Purely on the basis of experience with large systems, it is reasonable to estimate that continued experimental and development costs may

thousand per year. Such a figure is meant to include modest but steady continuous file building, modifications and additions to the existing software, and a reasonable amount of machine time for debugging and experimentation by the analysts.

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In the longer term, the costs depend on the final system features which are found necessary for the analyst to make maximum efficient use of the data base. It is entirely possible that a fully developed system may require a central processor of

the speed of an IBM 360/50 or larger with substantial core and disk

access. Such a configuration may involve annual rentals ████████ 25X1A

25X1A ██████ Graphics peripherals, software maintenance, continued

file maintenance, auxiliary operators and other supportive personnel,

etc., may well raise the cost ██████████████ 25X1A

II. CONCLUSIONS AND RECOMMENDATIONS

A. Computer graphics software development and operational

costs are high. DDI must prevent a proliferation of uncoordinated

development efforts which are bound to follow an increased interest

in computer graphics applications.

B. AUTOMAP should be encouraged to develop an operational

computer graphics capability in connection with its digitized

map library.

C. NPIC should devote modest exploratory effort to assessing

the likely improvement in visual cognition on the part of the PI

were he given a full "animated" computer graphics capability in

conjunction with mensuration.

D. Some serious attention ought to be given to the possibility

of replacing the optical background imagery (maps) in the present

25X1A ██████████ using the BR-90 with a digitized map library and computer

graphics display capability.

E. Reasonably formal test plans ought to be prepared for

25X1A the present ████████ forthcoming trials to provide for a systematic

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approach to its testing, evaluation of system requirements, and comparison of alternative system features. Enough uncertainty exists about a number of system features such that the present project ought to be considered as experimental, and not as the first stage of the development and implementation of the system.

F. Proponents of the ███████ system should be aware that development and implementation costs (in terms of new, or modifications to existing software, hardware rental, and file preparation and maintenance) will be substantial ████████ ██████████ for the next 2-3 years. Should the system prove useful and successful, it may require dedicating to it a fair fraction of a large processor (IBM 360/50 or larger) plus associated data communication and terminal equipment. Annual costs will then probably be in the range ████████████████.

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ORGANIZATIONAL AND MANAGEMENT ASPECTS